

WHAT IS CLAIMED IS:

1. A method for filtering a feed liquid, the method comprising:
 - providing a vessel;
 - providing a membrane module, the membrane module comprising a plurality of porous hollow fiber membranes, the membranes comprising a plurality of pores and an outer surface, wherein the membranes are mounted in a header in close proximity to one another so as to prevent excessive movement therebetween, wherein the membranes form an array, wherein gas bubbles may be introduced into the membrane module, and wherein the membrane module is contained within the vessel;
 - providing a feed liquid to the vessel, the feed liquid comprising a fouling material, wherein the feed liquid is provided to the vessel at a rate sufficient to cause an overflow;
 - applying a transmembrane pressure to the membranes in the module, whereby a filtrate passes through pores in the membranes, thereby producing a concentrated feed comprising the fouling material in the vessel; and
 - removing the fouling material from the vessel, wherein the fouling material is carried out of the vessel in the overflow therefrom.
2. The method according to claim 1, further comprising:
 - connecting the header to a source of a pressurized gas; and
 - providing, through the header but not through the pores of the membranes, gas bubbles in a uniform distribution relative to the porous membrane array such that the gas bubbles move past the outer surfaces of the membranes and vibrate the membranes to dislodge the fouling material therefrom.
3. The method according to claim 1, further comprising:
 - mounting the membranes relative to one another so as to produce a rubbing effect between the membranes when vibrated.
4. The method according to claim 3, wherein the hollow fiber membranes are arranged in at least one bundle.

5. The method according to claim 4, wherein the bundle is surrounded by a perforated cage, whereby excessive movement between the hollow fiber membranes is prevented.
6. The method according to claim 4, comprising the additional step of:
providing gas bubbles from within the module through gas distribution holes or openings in the header.
7. The method according to claim 1, further comprising:
providing gas bubbles from within the module through at least one tube situated within the module.
8. The method according to claim 7, wherein the tube comprises a plurality of holes.
9. The method according to claim 7, wherein the tube comprises a comb of tubes.
10. The method according to claim 1, further comprising:
draining down a liquid within the vessel to remove accumulated solids dislodged from the membranes.
11. The method according to claim 10, wherein the draining down comprises periodically draining down.
12. The method according to claim 10, wherein the draining down comprises continuously draining down.
13. The method according to claim 1, further comprising:
scouring the membranes.
14. The method according to claim 13, wherein the step of scouring comprises liquid backwashing.
15. The method according to claim 13, wherein the step of scouring comprises pressurized gas backwashing.
16. The method according to claim 13, wherein the step of scouring comprises chemically cleaning.
17. The method according to claim 13, wherein the step of scouring comprises chemically dosing.

18. The method according to claim 13, wherein the scouring is continuous.
19. The method according to claim 13, wherein the scouring is intermittent.
20. A filtration system comprising:

a membrane module comprising a plurality of porous hollow membrane fibers, each of the fibers having an upper end and a lower end, the fibers extending longitudinally between and mounted at the upper end to an upper potting head and at the lower end to a lower potting head, wherein the fibers are sealed at the lower end and open at the upper end to allow removal of a filtrate, the fibers being arranged in close proximity to one another and mounted in a bundle in a substantially taut manner between the upper potting head and the lower potting head to prevent excessive movement therebetween, wherein the fibers are surrounded by a perforated cage to further prevent excessive movement of the fibers, the fibers being substantially uniformly mounted in the lower potting head relative to a distributed array of aeration holes in the lower potting head, wherein the aeration holes are sized and located such that bubbles, formed by a pressurized gas passing therethrough when the module is immersed in a liquid, pass substantially uniformly between the fibers, wherein the lower potting head is connected to a source of the pressurized gas, and wherein the fibers are arranged to be vibrated by the gas bubbles, the fibers being mounted relative to one another so as to produce a rubbing effect between the fibers when vibrated by the gas bubbles; and

a vessel, wherein the membrane module is situated in the vessel, the vessel comprising a feed inlet whereby a feed liquid is provided to the vessel at a rate sufficient to cause an overflow, such that at least one fouling material is carried out of the vessel in the overflow.

21. The filtration system according to claim 20, further comprising a porous sheet through which a pressurized gas is supplied, whereby gas bubbles are provided from within the module.

22. The filtration system according to claim 20, further comprising at least one porous tube through which a pressurized gas is supplied, whereby gas bubbles are provided from within the module.

23. The filtration system according to claim 22, wherein the porous tube comprises a comb of porous tubes.

24. A method of removing accumulated solids from an outer surface of a plurality of porous hollow fiber membranes, the method comprising:

providing a plurality of porous hollow fiber membranes, the porous hollow fiber membranes extending longitudinally in an array to form a membrane module, wherein the membranes are arranged in close proximity to one another and mounted to prevent excessive movement therebetween, wherein the module is contained within a vessel;

providing, from within the array, by means other than gas passing through the pores of the membranes, uniformly distributed gas bubbles, the distribution being such that the bubbles pass substantially uniformly between each membrane in the array to scour the surface of the membranes, vibrate the membranes, and remove accumulated solids from within the membrane module; and

removing accumulated solids from the vessel, wherein the accumulated solids are carried out of the vessel in an overflow of a concentrated feed therefrom.

25. The method according to claim 24, wherein the membranes are mounted vertically to form the array and the bubbles pass generally parallel to a longitudinal extent of the fibers.

26. The method according to claim 25, wherein the uniformly distributed gas bubbles are provided at a lower end of the array.